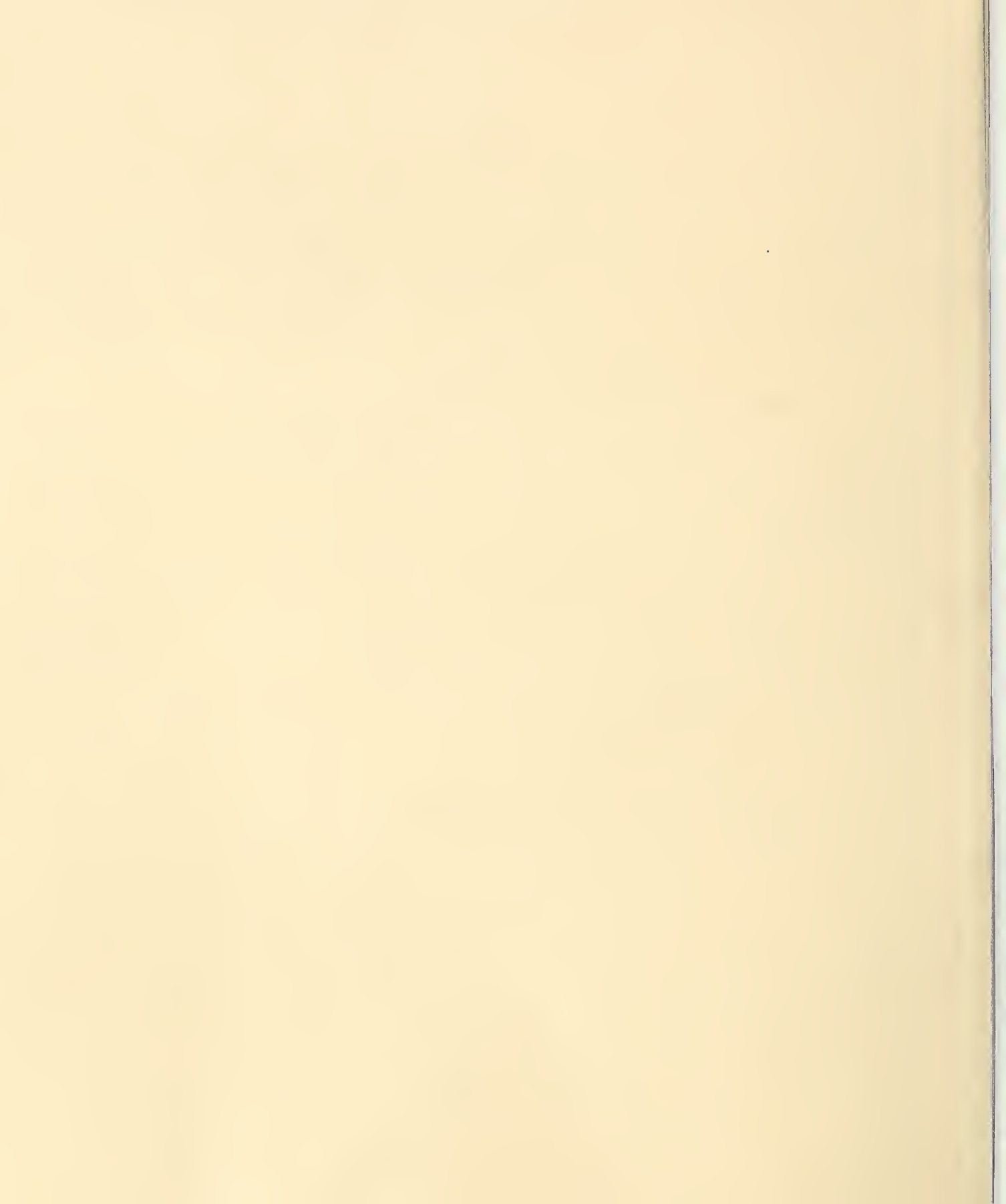


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EXTENSION SERVICE

REVIEW

U S DEPARTMENT OF AGRICULTURE * OCTOBER 1965



marketing development

The Extension Service Review is for Extension educators—in County, State, and Federal Extension agencies—who work directly or indirectly to help people learn how to use the newest findings in agriculture and home economics research to bring about a more abundant life for themselves and their communities.

The Review offers the Extension worker, in his role of educational leader, professional guideposts, new routes and tools for speedier, more successful endeavor. Through this exchange of methods, tried and found successful by Extension agents, the Review serves as a source of ideas and useful information on how to reach people and thus help them utilize more fully their own resources, to farm more efficiently, and to make the home and community a better place to live.

ORVILLE L. FREEMAN
Secretary of Agriculture

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EXTENSION SERVICE

REVIEW

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EDITORIAL

Have you ever thought of launching a new food product? And anticipated thousands of eager customers buying your product? You're sure you have a winner—deep-down you know you can't lose. But before you make the plunge take a look at the scoreboard of those who have made the plunge. Here are some figures garnered from a study released this past August by the U.S. Department of Agriculture.

An estimated 5,000 to 6,000 new food products were introduced in 1963.

But remember you have to sell the grocer or the food store before you sell your new food product to the customer whom you hope will be a steady buyer.

But here are the facts: Only 1,800 of the some 5,000 to 6,000 new food products introduced in 1963 were accepted for sale by grocers.

Of the 1,800 only 500 survived more than a year.

In this issue you'll get a perspective of educational work in marketing, including the development and marketing of new food products.—WAL

Market Development— One Phase of Extension's Total Marketing Program

by RICHARD G. FORD, *Extension Economist*
Division of Marketing and Utilization Sciences
Federal Extension Service

Extension marketing and utilization educational programs provide technical and economic information to people who make marketing decisions. These marketing decisions are of three basic types; 1) to identify and to define important problems which affect their operations or well-being and to discover available opportunities, 2) to investigate and analyze the alternative actions or changes which will provide solutions, and 3) to choose that alternative which provides the most satisfactory solution given the conditions which the decision-maker faces.

Marketing and utilization are concerned with all the "services and activities connected with changing the form of goods and moving them from producer to consumer." Consequently, Extension marketing and utilization programs are conducted with many groups in the marketing system—from producer to consumer. Such educational programs provide the latest research results and evaluate the use of such information to producers, assemblers, processors, distributors, and consumers.

The objective of Extension marketing and utilization work is to contribute to improvements in the marketing of agricultural products. This includes providing producers, consumers, and marketing firm decision makers with research results and other information from which they may: 1) obtain a comprehensive understanding of the operations of various phases of the marketing system (such understanding is essential if adjustments are to be made to changes in technology, supply, government programs and regulations, and demand); 2) reduce unnecessary costs of marketing agricultural products; and 3) expand the uses of agricultural products.

The Cooperative Extension Service has a longstanding obligation and a legal mandate to conduct marketing work. The legal mandate is expressed in the Smith-Lever Act of 1914 and is further supported by Hearings prior

to the Act. In addition, the Agricultural Marketing Act of 1946 spells out very specifically Extension responsibilities in marketing and utilization.

This is the third issue of the *Review* devoted exclusively to a particular phase of Extension education in marketing and utilization. The first issue defined Extension's educational role in marketing and utilization and illustrated the wide range of activities in which marketing specialists and county agents are engaged (November 1963). The second issue concentrated on market feasibility and illustrated some of the many facets and approaches involved depending upon the commodity, the area, and the degree of detail required (September 1964). This issue is concerned with some of Extension's activities in market development—another of the numerous areas of Extension marketing work.

Market development includes the development of new agricultural and industrial products (known as product development) and the expanded use of existing products. Effective market development work (examples discussed in later articles of this issue), necessitates a high degree of interdisciplinary cooperation from such disciplines as plant and animal physiology, chemistry, nutrition, bacteriology, genetics, psychology, economics, engineering.

Market and product development educational work affects and involves many people in many different parts of the economy. Producers of agricultural products are vitally interested in research and educational work which increases the demand or use of their products because of its salutary effect on producers' incomes.

Processing or manufacturing firms are also vitally interested in research on new products. The introduction of successful new products is essential to the growth and competitive position of many firms. Increased supply and use also benefit consumers because high volume process-

ing and distribution usually result in lower costs and prices. In addition, new products provide consumers with new satisfactions or conveniences which they have not had, but many of which they will buy when they learn of them.

Also, the result of much market or product development work combined with advanced technology, mass merchandizing, competitive prices and improved marketing efficiencies provide consumers with convenience foods—foods in new forms or uses. These may cost less than the fresh or less-highly-processed or serviced product. Consequently, many convenience foods have strengthened somewhat the demand for some foods and services. For example, the development of processed potatoes undoubtedly helped to reverse the longterm decline in the per capita consumption of potatoes.

One of our major objectives is to increase the efficiency of the marketing system. Extension works at three major points or levels in the marketing system. The first is at the production level—helping producers do a better job of marketing.

This includes helping individuals make decisions with respect to what, when, where, and how to market. It includes also assistance to groups of producers on alternatives for enhancing income through group action in the marketing of their products or purchasing of supplies.

Extension agents are making an important contribution at this level by helping producers understand the need for producing a product which can most efficiently be transformed into the final product, and at the same time not increase production costs or reduce net income.

With the development, acceptance, and consumption of more highly-processed and convenience foods, the greater is the need and the opportunity for Extension agents to do more market development work because highly-processed and convenience foods are many forms and many processes removed from the raw product which producers sell.

For these commodities, the marketing system is long, and many changes are made in the raw product after it moves beyond the producer's gate. Consequently, for many commodities, producers are not producing directly for the ultimate consumer, but for the marketing system—a system which functions for the sole purpose of providing consumers with products where they want them, when they want them, and in the many forms they want them at prices reasonable to all.

The second level of the marketing system at which Extension works is the processing level. At this level Extension agents are helping producers and processors coordinate their production to facilitate efficient assembly. This is an area where the agent's production training is most useful. One prerequisite to market and product development is a product which is uniform in many ways such as quality, size, shape, composition, weight. The attain-

ment of the uniform characteristics requires that producers grow uniform products, and uniformity can be obtained only through coordination of varieties, planting dates, cultural practices, grading. Cooperative producer organizations are often organized for the purpose of assembling the production of many small producers into large enough lots for efficient selling and processing. Extension agents are doing very effective work with these groups.

Extension marketing workers also assist processors with their technical processing and distribution problems. In addition, they assist processors to think through the least costly alternative methods and techniques available to them given the production and marketing conditions facing them. Many processing firms continually evaluate their "product mix"—the combination of items to manufacture, and the form in which to manufacture and package them. Extension marketing specialists assist these firms when they introduce new or improved products by interpreting the latest research on how certain operations can better be performed (such as freeze-drying) and help them evaluate consumer acceptance. This includes studies on the effects of various types of advertising and promotional campaigns.

The third major level of the marketing system at which Extension works is with consumers. Our domestic consumers make up the largest, the most diverse, and the most complex group. Opportunities to do market development work with consumers are infinite because of the multitude of buying decisions the 195 million people in our country have as consumers.

Extension agents and specialists assist consumers in evaluating desirable characteristics among products and brands in relation to cost as well as provide information on such other programs as the school lunch and food stamp plan. With the increasing avalanche of new, improved, and slightly altered products; color, shape and size of packages; and package weights coming onto the market, consumers are in need of reliable information which will help them make logical choices.

Foreign markets as an outlet for agricultural products are growing and are now a major outlet for certain commodities. Marketing work in foreign trade is a combination of the three above levels but has its own unique characteristics because of differences in customs, tastes, trade and exchange regulations. Exports could be further expanded if we knew more about the end-products which are made from our exports. Educational work needs to be done which will relate the end-product to raw materials. The nature of the demand of foreign consumers for U.S. agricultural products needs to be understood so that domestic producers will have the opportunity to produce the type or variety of raw product which can be processed efficiently into those products foreign consumers want. □



FARMERS'
SHARE

100%

MARKETING
MARGIN

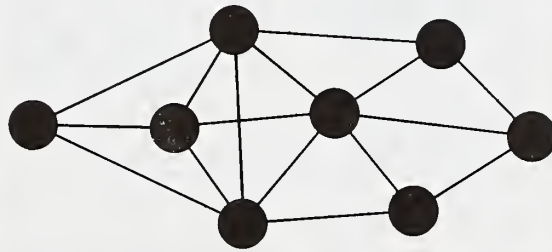
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The Dynamics of Agricultural Marketing

by ROBERT E. FREEMAN,

Agricultural Economist, Marketing Economics Division, Economic Research Service, USDA



WE ARE well aware of many dramatic changes in the marketing of farm products. As consumers we have seen supermarkets, convenience stores, and discount houses develop at the expense of the independent corner grocery and traditional department stores. We have used new forms of frozen, dried, and partially-prepared foods; improved fabrics; and filter tips on our cigarettes. Synthetic foods, including "meats" from vegetable protein, are gaining a foothold. Less obvious, but no less important, changes in marketing include improved refrigeration, bypassing of terminal markets, vertical integration, increased emphasis on packaging and promotion, and more meals eaten away from home.

Farmers and agricultural colleges take a much broader view of marketing than do industrialists, and schools of business. To the manager of a business firm, marketing involves only the distribution of his product or service. By contrast, we agriculturalists have a "gate-to-plate" concept, including all the operations from farmer's gate to consumer's plate. Our view of marketing covers assembly, processing, wholesaling, retailing, exporting, restaurant service, and transportation at all stages.

There are interconnections among all these functions. Some milk is still delivered by producer-dealers directly to consumers and some fruits and vegetables are sold at roadside stands, but most products pass through many marketing agencies.

Thus defined, agricultural marketing is a big business. In 1964 consumers spent \$68.7 billion on foods produced on U.S. farms. Farmers got \$21.9 billion for these products at point of first delivery, and the value added by the myriad of marketing services was \$46.8 billion. Consumer expenditures for all foods were \$80.0 billion, equal to 18.5 percent of their disposable income.



Out of a total civilian employment of 70.4 million persons, there were 6.1 million farm workers, family or hired, and nearly twice that number of persons involved in marketing.

Agricultural production and marketing are mainly performed by private enterprise. Farmers and marketers are guided by their costs of production, prices received for their goods and services, and the hope of profits. The "unseen hand" of competition coordinates the process so U. S. consumers can be confident of their unprecedentedly abundant daily supplies of food, fiber, and tobacco.

Public bodies aid the private sector by providing law and order, facilitative services such as a monetary system, enforcement of contracts, weights and measures, education and mail service, regulations to enforce rules of the game, and such direct aids as price supports and food distribution for the economically-disadvantaged in our society. In the field of agriculture USDA, the Land Grant colleges, the Extension Service, and State and local agen-

cies have been particularly active in assisting farmers.

Technology is the principal agent of change in marketing and in farming, as it has been in all industrialized societies for the past two centuries. The process of industrialization reduces the proportion of workers and other resources which are required in agriculture. As our experience in the United States demonstrates, returns in agriculture tend to be depressed during a period of rapid change such as we have had since World War II. Despite the cost-price squeeze, the farmer's standard of living has risen and the urban-rural gap has narrowed. However, farmers still lag behind many other producer groups in the advancing standards of living made possible by the larger share of effort devoted to nonagricultural goods and services.

There are some suggestions that agricultural research should be halted until price-depressing surpluses are eliminated and farm incomes improved. Such a course would, clearly, be contrary to the technological progress which has kept the Nation strong and raised standards of living. Farm problems do suggest that more effort be made to help farmers adjust to the rapid pace of changes in production and marketing.

In the marketing field farmers rely increasingly on joint action through their cooperative associations. They also push for more effective governmental services in market news and inspection and grading. They also avail themselves of State and Federal marketing agreements and orders.

Changes in farming, marketing, and consumption affect each other in many ways. Most changes since World War II have led to a larger role for the marketing agencies. For example the number of agricultural workers declined from 10.4 million in 1947 to 6.1 million in 1964 while total population rose from 144 to 192 million.

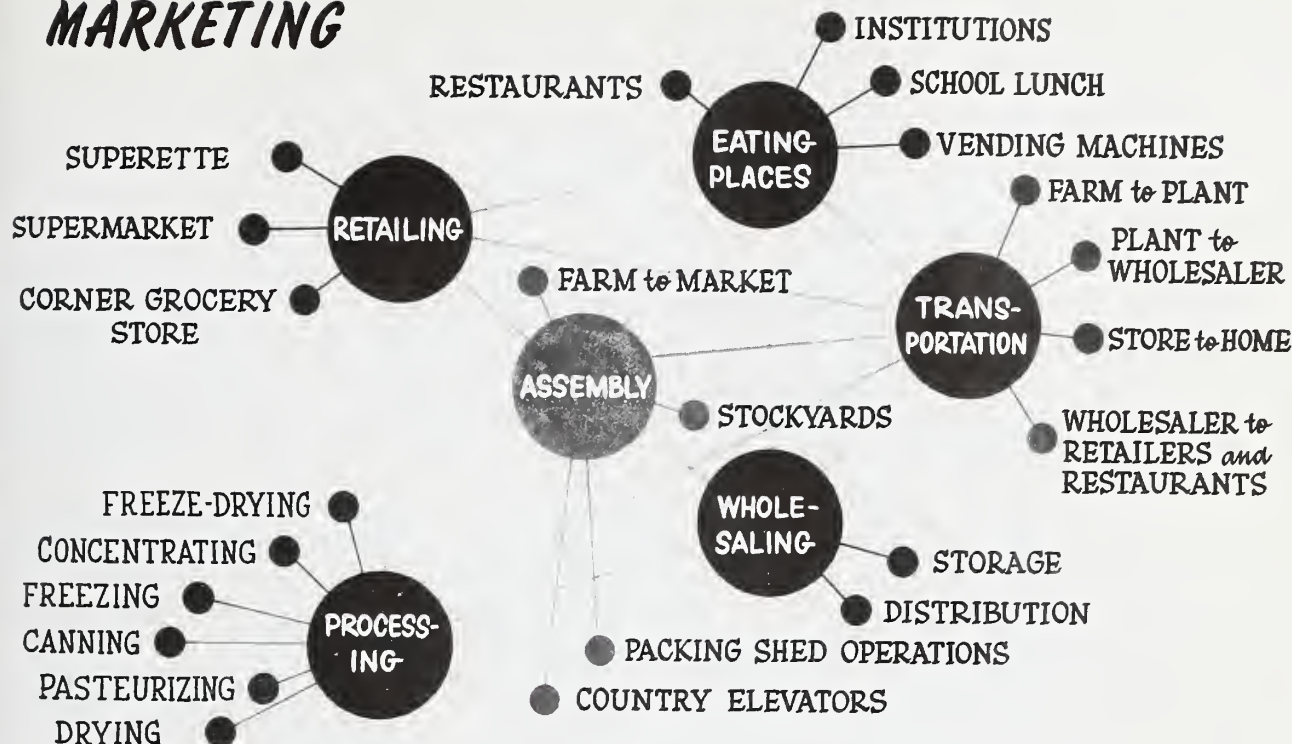
The marketing system has grown because there are fewer farms and more consumers. Marketing has also grown because farmers are more specialized, in order to use their expensive equipment more efficiently, while consumers have an ever-wider choice of products. Furthermore, farmers are more commercialized and buy more of their equipment, fertilizer, and fuel in the marketplace.

CHANGES IN FARMING, MARKETING & CONSUMPTION



Production expenses accounted for 50 percent of gross farm income in 1947 and were up to 70 percent in 1964. Meanwhile rising consumer incomes and urban living create a demand for restaurant eating, fancier and tastier foods, and ready-to-cook and ready-to-eat foods. Proc-

MARKETING



essors and retailers provide more merchandising and customer services. It seems likely that the marketing system will continue to expand.

Most farm products move directly from the farm to processing plants, so there are only a few products for which there are firms primarily doing business as assemblers. The huge stockyards at Chicago and other terminals have been largely displaced by smaller ones and by direct-buying. Country grain elevators have gotten much larger, but there are fewer of them and a third of them are operated by cooperatives. The fruit and vegetable packing sheds and receiving stations for milk and eggs are the other main types of assembly operations.

The tremendous rise in the output of frozen fruits and vegetables illustrates the success of a set of new processes.

The second big growth sector is in poultry, where broilers are essentially a new product, much cheaper in relation to meats than 15 years ago. The growth of the broiler industry involved new breeds of birds, mechanization of production, contract financing by feed companies, USDA inspection and grading, and a low-margin policy by the supermarkets. Marketing is done by the feed dealer who links the production and processing operation and often carries through to the food retailer. The farmer grows the broilers under specific contract and makes none of the marketing decisions.

Other processing operations which have grown faster than population include dairy products, meats, and canned fruits and vegetables. Slower growing processes are bakery and grain mill products.

In most lines, there has been a decline in the number of processing plants reflecting the basic drives to achieve economies of scale. One exception has been the meat-packing business. This has become decentralized from the terminal markets to country points. Both the number of plants and number of firms have increased. The other exception is poultry dressing, where the fourfold increase in volume was accompanied by a doubling of plant numbers.

The two major changes in food retailing are the rise of the supermarket and the gain in the share of business done by the affiliated independents.

Grocery stores doing \$500,000 or more business per year accounted for only 2 percent of the total number of stores in 1948 but already made 26 percent of the sales. In 1963, "supers" comprised 12 percent of the number and did 75 percent of the business.

The biggest chains have not increased their share of total grocery sales since World War II. In fact, the nationwide chains were slow to adopt supermarkets and did so only after their competitors demonstrated the advantages of the supermarket.

The smaller chains have grown and the total chainstore share has risen moderately. Affiliated stores have grown rapidly, their share of the total grocery business rising from 29 percent in 1948 to 49 percent in 1963. They include voluntaries (wholesaler sponsored) and cooperatives (retail store sponsored). Since 1953, the affiliated groups have accounted for a larger share of total grocery sales than the ownership chains. The share of the unaffiliated independents has declined drastically, from 34 percent in 1948 to 10 percent in 1963.

These trends in grocery store ownership are reflected in wholesaling. The chains tend to own their wholesale facilities. However, wholesalers are gaining in other portions of food trade. They are a key element in supplying affiliated grocers, there are more specialty wholesalers and the restaurant and institutional trades depend mainly on wholesale suppliers.

Away-from-home. Trade data indicate that this market is growing rapidly and that consumers spent about \$25 billion on meals at restaurants and institutions in 1964. We know little about the quantities of the various food served. USDA is developing cooperative research projects with the trade to determine the quantities and origins of foods consumed and other aspects of this sector of the marketing system.

Exports. U.S. agricultural exports were up during and after World War II and the Korean action. They then declined to a 1953 low of \$2.8 billion. They have risen to a 1963-64 level of \$6.1 billion. This total includes grants and sales for local currencies under Public Law 480, and some of the dollar sales have had governmental assistance. However, the greatest growth has been in commercial sales without assistance. Moreover, long-range prospects are good. The developing nations will need food and the U.S. is a highly-efficient producer of many basic foodstuffs.

Exports are a major outlet for many of our products. In 1963-64 exports of wheat and flour accounted for three-fourths of farm sales of wheat and flour, over half of our rice, over one-third of our tallow and soybeans, nearly one-third of our cotton and over one-fifth of our lard, tobacco, corn, barley, and sorghum grain.



One of the principal advantages of the free enterprise system is the great incentive it provides for introducing new methods, products, and services. The firm which successfully innovates a product or cost-saving method of production reaps large profits until others copy or improve

on the discovery. Innovations in farming, marketing, and throughout the United States economy have reduced the proportion of our income spent for food to lower levels than anywhere else on earth. U.S. consumers spend less than 19 percent of their income for food as compared with about 25 percent in Sweden, 30 percent in France, and 50 percent or more in such less-developed lands as Ceylon and Ghana.

Two of the most significant areas of innovation showed up in our discussion of processing, in the form of tremendous increases in the output of frozen fruits and vegetables and of broilers. The soybean is a prime example of a new crop. The loss of our coconut oil supplies in World War II gave impetus to U.S. production of soybeans. They now provide two-thirds of all domestic vegetable oil, and three-fourths of all oilseed meals for livestock feed.



Such a simple-appearing innovation as the paper carton for milk had a greater effect than is generally realized. It was a big factor in shifting sales of milk from home-delivery to grocery stores, usually at substantial savings to consumers. The filter tip for cigarettes and homogenization of leaf tobacco have drastically altered the types and grades of tobacco needed for cigarettes and cigars. Cotton fabrics have made a substantial comeback through the development of wash-and-wear processes. The new stretch-weave process gives promise of further marketing gains. The USDA Western Utilization Research Laboratory has developed the promising "Wurlan" process to make woollens machine launderable.



We are all aware of the growing array of convenience foods available in our supermarkets in ready-to-cook or ready-to-eat form. Many of them cost more, but are welcome for the time and effort saved. However, a recent USDA study showed that frozen orange juice concentrate and many other convenience foods were cheaper than the equivalent raw foods because the extra costs of processing were more than offset by savings in transportation and handling costs.

In some ways though, we are overly impressed with the new items. Total output of processed foods increased only 12 percent faster than population from 1947 to 1964. We still take most of our food home and cook it, and our diets have not changed drastically. In reviewing the whole field of our industrial organization in the United States the food trades show a comparatively slow rate of change, while the electronics, atomic energy, and space industries are leaders in rapid development.

One of the major hopes for the Research and Marketing Act of 1946 was that large-scale new uses could be developed for farm products. The four utilization research laboratories are widely credited with important achievements. However, it must also be recognized that coal, petroleum, and other substances are comparatively cheap raw materials and that industry is rapidly developing products from them which compete with natural fibers, oils, and even with foods.

Competition is also keen within the food field as producers of old and new products strive to gain consumer acceptance. Our acceptance of new foods is commonly gained by price advantages, attractive packaging, and promotion. These, though, can be as effective a means of introducing new foods as the dietary shortages of protein in the underdeveloped lands.

As farmers become more specialized and commercialized and as consumers demand or accept more services

and their real incomes improve, the marketing system will continue to grow.

Really drastic changes in foods, oils, and fibers seem technologically possible. However, such a sudden revolution does not seem likely. In our affluent society there is no urgent need to substitute vegetable proteins for meat and poultry.

We look forward then, to a continuation of recent trends in marketing. Some of these major trends: many new products and processes will gain consumer acceptance, the retail trade has become the dominant force in marketing, the effort and expenditures on merchandising and promotion have grown, farmers have relied increasingly on cooperatives and joint promotional efforts, and governmental services have grown as the marketing system has become more complex. It seems likely that consumers will continue to spend a smaller proportion of their rising incomes on food. □

Extension Education on Advertising and Promotion

by EDWARD DAILEY,
Extension Economist, Purdue

THERE IS a growing demand among producer groups for data, concepts, principles, case histories, and research results relevant to advertising and promotion of farm products. Interested groups are calling more and more upon Extension workers to provide guidance and information to help them in their decision-making; to help them make more meaningful judgments about optimum conditions for advertising and promotion; to help them reduce the probability of errors in planning.

For example, greenhouse tomato producer groups interested in improving their returns through advertising and promotion called on Ohio Extension Marketing Specialists, Ed Royer and Paul Thomas recently. Fred Perkins, Extension Marketing Specialist in New Jersey, has met several times with groups studying the formation of a commodity council for promotional purposes. Tom Stanley, Vermont Extension Economist, used case problems in a work session with a combined commodity marketing committee.

Other Extension workers such as Don Long (Virginia), Jeanette Lynch (Colorado), and O. E. Allen (Missouri) have met with State Departments of Agriculture, pro-

ducer-promotion groups, and farm organizations. Educational programs have been carried out by these folks helping farm leaders to understand the relevance advertising and promotion has in expanding their product's demand.

Latest surveys show over 1,200 commodity groups are spending about \$100 million per year for promotion.

Early efforts to advertise and promote farm products were made by a California marketing cooperative in 1907. In that year \$10,000 was spent by this group to promote oranges in Iowa. Over the years, promotion activities by producer-promoter groups have varied greatly. Farm products were promoted vigorously during the depression years and up to World War II and the Korean War, commodity promotion has expanded both in numbers of groups promoting and in size of budgets.

Producers and others have become increasingly interested in the promotion of farm products. Cooperative Extension workers are being pressed to provide guidance. While promotion has long been used by some commodity groups, to others it is new and untried.

Extension has broadened the scope of its educational work to better serve agriculture and related business. Extension policy statements point out the need for educational work in the marketing of farm products and especially in expanding the demand for these products. Advertising and promotion is an important part of the marketing mix. Educational programs in this area are an essential and logical part of the work to increase efficiency of marketing agricultural products.

A major overall objective is to provide educational assistance to commodity groups and others in helping them make decisions about promotion of their product or products which will contribute to marketing efficiency. Some specific objectives are to help decision-makers: 1. under-

stand the role of advertising and promotion with respect to the marketing of farm products, 2. analyze their promotion opportunities, 3. define their goals and set specific objectives, 4. plan effective promotion programs, 5. develop alternative plans, and 6. have program evaluation.

Recognizing the growing responsibilities and opportunities for Extension education relative to the promotion of agricultural products, the Federal Extension Service contracted with Purdue University to develop some educational materials and resource information on promotion. These materials are designed primarily for use by Extension workers in conducting educational programs with commodity and industry groups interested in the promotion of their products. Materials developed under this contract include the following.

1. An annotated bibliography, including a discussion of major promotional problems and sources of information for solving them.

2. Guidelines for advertising and promotion of agricultural products (including a systematic consideration of 16 important factors to study when evaluating the feasibility of promoting a product, evaluation of promotional effectiveness, and complementary activities for expanding markets and net returns).

3. A guide for developing educational programs in advertising and promotion.

Slide sets and scripts were prepared to accompany the printed materials and are available from Purdue to the States. Seminars have been held at three different locations (Midwest, East Coast, and West Coast) to acquaint Extension workers with the materials and to explain how these materials may be used in working with promotion-minded commodity groups. Case-problem situations have been developed and used to add realism to abstract promotion principles.

The Federal Extension Service plans to continue its assistance to State Extension workers by fulfilling requests for in-service training of staff members and assistance in working with commodity and industry groups interested in promoting their products.

Results of adult educational work are not always easily measured. Even in areas of long-standing Extension activity, action by decision-makers may result from a combination of factors. The following examples illustrate some recent Extension educational activities in advertising and promotion of farm products.

In New Jersey, after several meetings of the blueberry industry, the group decided not to promote at this time. Extension personnel using a promotability audit helped them analyze their promotion opportunity in the process of making their decision. Their decision was in keeping with research studies of promotion effectiveness that show considerable variation exists in the opportunity for promotion. Through these meetings producers acquired a greater understanding of the role and effectiveness of promo-

tion which influences their decisions.

The opportunities for promotion educational work vary from State to State. Extension personnel have played a number of different roles. In addition to close counseling with individual groups and with boards of directors, State-wide workshops and seminars have been conducted. One such school was held recently in Charlottesville, Virginia. Participants included State Department of Agriculture officials, managers of commodity groups, research workers, advertising agencies representatives, State Extension specialists and Federal Extension personnel. Workgroup sessions focused attention on market targets, promotion objectives, alternative promotion plans, and program evaluation for two newly-established Virginia commodity groups—eggs and sweetpotatoes. At a similar meeting held in Missouri, State officers of farm organizations participated as well as other categories of personnel.

One of the newer farm products receiving marketing assistance is privately developed recreation facilities that utilize rural resources. In Indiana a district school has been held for county agents to outline promotion principles and guidelines to enable these agents to better serve clientele who may need such help. A newly developed enterprise was analyzed to provide case study materials and the operator was counseled about his alternatives.

Advertising and promotion work in farm commodities is somewhat unmapped territory with few established procedures. Although the available materials such as the "Guidelines—Advertising and Promotion of Farm Products" published by Purdue University will be helpful, the ingenuity of the individual worker will continue to be important. Only with the passage of time can the impact of Extension's contribution to decision-making among commodity groups with respect to advertising and promotion be fairly judged.

An important bonus or fringe benefit in this work is that of uncovering basic marketing problems which require the consideration and remedial action of producers and market interests. Producer groups formed for promotion purposes may find basic industry problems such as quality control, adequate distribution, and grade standards should first be solved before promotion can be effective.

As progress proceeds in meeting educational objectives Cooperative Extension specialists working with commodity groups and agricultural business can contribute to the efficiency of marketing agricultural products by helping decision-makers to: 1. analyze their promotion potential, 2. define their problems and alternative solutions, 3. define their objectives and goals, 4. plan effective promotions, 5. evaluate their programs, 6. make knowledgeable decisions on the basis of the best information available, 7. consider complementary activities to advertising and promotion programs, and 8. discover weaknesses in their product marketing practices that may have been traditionally overlooked. □



Harvesting white club wheat in the rolling Palouse Hills of Whitman County, Washington, the top-ranking wheat-producing county in the Nation.

Extension Helps Develop And Expand Markets for Pacific Northwest Wheat

by OWEN S. WIRAK,
Extension Marketing Economist, Washington

COOPERATION and mutual understanding have become the key links in a new chain of effort to expand foreign and domestic markets for wheat produced in the Pacific Northwest. Agricultural Extension has helped to forge these links through an industrywide educational program.

The production of wheat is a major industry in the Pacific Northwest. Farmers obtain more money from wheat than from any other crop. Income to railroads, trucking firms, barge lines, steamship companies, grain handlers, exporters, flour mills, and banks in the region depends to a great degree on the wheat crop.

The bulk of the crop is delivered to country elevators for storage at harvest time. Farmer-owned elevators ac-

count for 85 percent of interior commercial storage. Most of these firms are organized as independent cooperatives and are relatively large concerns averaging about two million bushels of storage capacity. The local cooperatives own a regional cooperative with terminal and subterminal facilities through which they market some or all of their grain.

Growers generally maintain ownership until their wheat is sold to an exporter, miller or feeder. Since 1949 the principal outlets for 85 percent or more of Pacific Northwest wheat production have been export markets in the Far East. The wheat movement is primarily westward by rail, barge and truck to Pacific tidewater terminals at Puget Sound and along the Columbia River.

About 65 to 70 percent of the grain produced in the

area moves to terminal positions by rail. However, with the completion of dams presently under construction on the Columbia and Snake Rivers, slack water navigation will be accessible to most of the producing areas in the region.

Exports of wheat and flour have played an important role in international commerce of the Pacific Northwest for over a century. On the average, about two-thirds of all wheat exports in recent years have been sold for foreign soft currencies under Public Law 480. Japan is the major hard currency market.

Trading differs from that of other major wheat areas because export sales are so important and there is no future market.

The entire industry is highly organized with wheat growers associations, wheat commissions, a growers' supported foreign market development entity and numerous trade organizations. All segments of the trade are represented in the Pacific Northwest Grain Dealers Association.

Although the region has many inherent and other advantages in the production of wheat, it also has many problems associated with the marketing of this important crop.

The importance of the export market has been mentioned previously. However, the extent and nature of

wheat exports varies greatly from one year to the next depending on supply—demand relationships and particularly on P. L. 480 authorizations and the amount of the export subsidy. This situation along with the many changes which are occurring in the market structure for Pacific Northwest wheat places growers in a situation of increasing complexity in deciding what, when, where, and how to market.

Both producers and decision makers in the marketing system are faced with a growing problem of trying to conduct the everyday affairs of their business and at the same time recognize and understand the changes which are taking place, determine the adjustment alternatives available, and implement the most desirable adjustments. Such moves generally require new management skills, new technology, and large amounts of capital for operations, improvements, and new ventures.

The development of slack water on the Columbia and Snake Rivers is causing all segments of the industry to review positions and to attempt to determine the impact of slack water navigation on facility location and improvements, transportation costs and competitive relationships.

Freight charges are of extreme importance to the industry because the producing areas are so far removed from major markets. Efficient use of the transportation market

A typical country elevator station in the Pacific Northwest.



is a major factor in grain marketing for all segments of the industry.

Leading Pacific Northwest wheat growers, through the Oregon Wheat League and later through Western Wheat Associates, Inc., in cooperation with the Foreign Agricultural Service have pioneered in the development of foreign markets for wheat and wheat products such as Bulgur. The typical producer though, has been more concerned about the quantity of wheat produced than about the qualities (both from grade and end-use standpoints) or how the grain was marketed.

Although Far Eastern dollar markets for wheat have been growing rapidly, particularly in Japan, this growth is due largely to increased usage of hard wheats and feed wheat. In addition, Australia is competing strongly for the soft wheat markets traditionally supplied by this region.

The domestic markets for the region's wheat have remained relatively static for a long period of time until this last marketing year when feed use increased sharply. Lack of research data on the market potential for use of wheat for feed makes it difficult to predict the impact of this outlet on total supply-demand relationships.

When the present Extension grain marketing program was initiated about 4 years ago, it soon became evident that there was considerable lack of understanding and in

some cases real antagonism between various segments of the industry. Unless these attitudes could be changed, it was doubtful that any significant progress could be made. The first objective was to increase mutual understanding and cooperation among all segments of the industry, government agencies, and other entities who are concerned with the marketing of this important crop.

The Washington Association of Wheat Growers and the Washington Wheat Commission had expressed interest in a wheat marketing workshop. It was decided to use this as a vehicle to get leading producers and representatives of the trade and agencies concerned with grain marketing to sit down together to consider matters of interest to all—how wheat is marketed, what determines prices at terminal and local levels, and what is the nature of Government programs which affect the markets and marketing system.

The idea was to describe, explain, and analyze market organization and factors effecting market supply and demand. A policy was established and has been strictly followed that the workshops, which have now become an annual event, would be used to increase understanding of existing Government programs and would not be concerned with legislative proposals or resolutions. This created an atmosphere which permitted participants of widely different viewpoints to work together in a congenial, educational atmosphere.

The workshop programs are planned and conducted by a committee representing the Extension Service, the Department of Agricultural Economics, the Washington Association of Wheat Growers, and the Washington Wheat Commission. Resource people are drawn from the three Pacific Northwest Land-Grant Universities, as well as other universities throughout the country, various Government agencies, leading growers, representatives of grower organizations, and all segments of the trade. Excellent cooperation has been received from all concerned.

Four workshops have now been held with each program increasing in scope and depth. Because of the workshop nature of the project, attendance has been limited to about 100 participants. This educational effort along with similar meetings and workshops held in the major Washington wheat counties have materially contributed to the rapidly-increasing core of wheat leadership in Washington and to some extent throughout the Pacific Northwest.

The trade in general has recognized that their secretive attitudes in the past have contributed to the attitudes which existed among growers. When country and terminal elevator managers, merchandisers, millers, and exporters, outlined the nature of their businesses, the large investments involved, the risks and uncertainties, their operating practices and margins, the basis for prices bid for grain, etc. they found producers to be sympathetic and understanding.

Leaders throughout the industry soon realized there was

Loading a grain cargo ship at a Pacific tidewater terminal.



A panel considers the economic and political aspects of wheat exports during a wheat marketing workshop.



so much for everyone to gain by working together.

When the USDA Agricultural Marketing Service (now the Consumer and Marketing Service) proposed substantial revisions in the U. S. Standards for Wheat, trade representatives and growers worked hand-in-hand under leadership of a tri-State grain standards committee to carefully study the impact of proposed revisions in grading factors and dockage on the industry. Large numbers of samples were collected at country points by elevator operators for grading. State inspection reports on export cargoes were examined to compare the quality of wheat being exported with country grades. When a hearing was held in the area on proposed revisions, the industry from growers to exporters were able to present a united case based on factual data rather than opinions.

Educational work with country elevator firms receives major emphasis and is carried on in cooperation with an industry advisory committee representing all types of country elevator concerns—cooperatives, non-cooperative corporations, and proprietorships.

The objectives are to help elevator managers increase their merchandising abilities and knowledge of domestic and international trade in wheat as well as other cereals and to increase operational efficiency of the firms, both technical and economic.

In order to increase or even maintain both domestic and dollar export markets for Pacific Northwest wheat, the trade must supply customers with the type of wheat they want at competitive prices. If a customer wants low protein White Club and gets a high protein Soft White, he will go elsewhere to secure his needs. If he is a domestic miller who wants a hard red winter wheat and all that is available is Soft White wheat, he will go to Mon-

tana or the Great Plains to get his supplies.

A variety of educational programs are used to assist country elevator managers. A Terminal Marketing School is held each year in cooperation with Oregon and Idaho Extension economists, exporters, terminal operators, port authorities, and various Federal and State agencies. In general, these schools have combined classroom sessions with tours to terminal and port facilities, the grain exchange, and processors. They are designed to increase participants' understanding of the market structures for cereals produced in the region, factors affecting terminal prices, the physical handling and inspection of grain at terminal elevators, and specific requirements of processors and other buyers.

Management audits are conducted of representative firms to obtain case study data and to be in a position to define with some precision key performance areas and the major problem confronting country elevator concerns. These studies also establish "benchmark firms" which can be used to evaluate the effectiveness of Extension programs over time.

The first of an annual series of workshops for elevator managers was initiated last fall. This project is designed to present over a period of 3 to 5 years, on a continuing basis, a course of instruction in subject matter ranging from general management principles to advanced management theory and strategy.

Most of the managers are college graduates with 10 to 15 years of practical experience in the grain elevator business at the executive level. The advisory committee was concerned that men of this caliber would not attend a workshop on management principles and would send their warehouse superintendents or office managers. This was



Participants in a grain marketing workshop that was held at WSU discuss some of the uses of white wheat.

not the case, however. The participants were experienced managers who were very interested in modern concepts of management. Typical of the statements by participants on evaluation sheets was the following: "Most of us are more aware of the complete job management must do. We have too long set back and followed old, out-dated methods. The seminar will guide us to new and better management levels."

Directors of cooperative and other farmer-owned elevator concerns are receiving training in the role and responsibilities of a director in a program being carried on for all cooperative directors in the State by Agricultural Extension and the State Council of Farmer Cooperatives. As directors advance in this program, special work sessions are held to aid in relating subject matter to problems which are peculiar to the grain industry.

A recent survey of grain elevator firms indicates that grain handling and merchandising practices are changing rapidly to adjust to new market conditions. Managers are training their elevator operators and equipping their stations to segregate wheat by subclass or variety, quality, and condition upon receipt and to be in a position to blend, clean, or condition grain to meet market demands.

An excellent example of what teamwork can accomplish is the adjustment which the industry made to the revisions in the grain standards last year. Extension workers, leading growers, members of the trade, the State grain inspection service, and the Consumer and Marketing Service all worked together to inform producers and country warehousemen about the nature of the revisions and the adjustments necessary to prevent unnecessary downgrading of the wheat during harvesting and receiving at country stations. It is estimated that this educa-

tional program resulted in adjustments both in harvesting methods and at country elevators which saved growers over \$1 million in grade discounts.

Largely as a result of Extension work which has been done with the grain industry, major areas requiring marketing research have been determined and considerably more research resources are now being devoted to this area. Recently initiated at Washington State University are projects in grain market structure, comparative costs of farm and commercial storage and feasibility of using Chicago Soft Red Winter Futures to hedge positions in white wheat.

It is difficult to assess the effectiveness of this or any other Extension program because the real yardstick of what has been done can only be measured by the actions of the people with whom we work. However, the spirit of cooperation, mutual understanding, and interest in marketing education which now exists throughout the industry should provide the basis for important strides in greater market development in the future, both domestically and foreign.

It is certain that the demand for wheat and wheat foods will continue to expand in the Asian areas. Two-thirds of the world's population live in these countries. Their per capita income and tradition is such that they depend on cereal grains for their food. In most of these countries, this demand is going to continue until such a time as the per capita income of the people allow them to purchase more luxurious food. This is unlikely to happen in most countries in Asia within the foreseeable future. In the meantime, the Pacific Northwest wheat industry will be working cooperatively and aggressively to increase its share of this huge market. □



The use of dialdehyde starch which was developed by the Northern Utilization Laboratory is what conveys wet strength to this facial tissue.

Many have seen the TV commercial with Harry James testing the strength of a facial tissue at the music end of his famous trumpet. Few realize, however, the contribution that Extension specialists have made to this and other new products for the expansion of markets for agricultural products.

Federal Extension Service utilization specialists are fulfilling a familiar role in extending and applying the results of research related to new products and processes and reflecting back to research workers the problems and opportunities for additional research which will contribute to the joint utilization-Extension objective of "finding new and expanded uses for agricultural products . . . thus providing the farmer new outlets for his crops . . . and the consumer new and improved products from farm crops."

Research to analyze farm products for their chemical constituents began when the Department of Agriculture was born in 1862. Specific research to find new and improved industrial, food, and feed uses for the raw products of the farm did not begin until after 1935.

In 1935, the Bankhead-Jones Act directed the Secretary of Agriculture to conduct scientific, technical, economic, and other research into the

FES Utilization Specialists Work with Industry and Research

by LEWIS F. NORWOOD, Assistant Director
Division of Marketing and Utilization Sciences
Federal Extension Service



laws and principles which underlie basic problems of agriculture in its broadest aspects. Among other things, this Act provided for a laboratory at Urbana, Illinois on the University of Illinois campus, to seek industrial uses for soybeans.

This facet of agricultural research was broadened to a full-scale thrust in the Agricultural Adjustment Act of 1938, which provided for a regional utilization research laboratory in each of the four major farm areas—Eastern at Philadelphia; Southern at New Orleans; Northern at Peoria, Illinois; and Western in Albany, California (near San Francisco). They were completed and in operation by April 1941.

There has been a steady expansion in the Department's utilization research and development program in the past 10 years. For instance, funds for program activities have risen from \$9.6 million in 1956 to nearly \$30.2 million in 1965. Research emphasis at the regional laboratories has been concentrated in the broad categories of cereals and forage crops; cotton and wool; fruits and vegetables; oilseeds; new and special crops; and poultry, dairy, and other animal products.

FES utilization specialists are now working closely with all four regional

research laboratories to extend research developments and to speed up their application. Utilization specialists do not, however, assume the responsibility for extending all of the regional laboratories' research, but have selected special products, processes, or equipment for giving emphasis. These areas of emphasis are usually selected by the specialist in cooperation with the Director of the Regional Utilization Research Laboratory, the Assistant Director for Industrial Development, the Laboratory Chiefs in charge of the research areas served, and the representatives of the FES Administrator.

One of the first areas selected for Extension concentration was cereals and forage crops with particular emphasis on the expanded uses of starches. Wheat and corn get primary research and Extension attention by reason of their abundance and because chemically they possess valuable properties with industrial potential. Starch is one of the most versatile and plentiful constituents of grain. Corn is about 70 percent starch and provides the major economical source of this material. To further broaden the industrial market for starch products, utilization research is seeking to improve its properties for existing applications and to reveal entirely new uses.

Starches with superior ability to impart strength and with outstanding adhesive properties are valuable to use in sizing and coatings for paper. Scientists believe it may be possible to chemically combine starch with cellulose fibers or to develop starch as a fibrous element of paper itself. Some 41 million tons of paper products such as corrugated box board, bagging paper, and gypsum board are used in the United States today—and use is rapidly expanding. These products could provide an outlet for 40 to 100 million bushels of grain, if only 2 to 5 percent starch were used. It has been established that 1.2 billion pounds of starch were utilized by the paper industry in 1964 to improve their products. This also expanded

the market for grain products.

A major breakthrough in starch chemistry has brought a versatile material known as dialdehyde starch—a product developed by the Northern Utilization Research Laboratory. This chemically-modified starch, now manufactured industrially, is already providing new and growing industrial outlets for abundantly-produced grain.

Kenneth R. Majors, FES Grain Products Utilization Specialist who works out of the Northern Laboratory in Peoria has responsibility for expediting the evaluation and subsequent acceptance by both processors and using firms of new cereal products developed at the laboratory with the objective of enlarging existing markets and opening new markets for grain products.

Majors has been giving considerable attention in recent years to acquainting paper and paperboard firms with new cereal products including dialdehyde starch, which has been developed at the Northern Utilization Laboratory. Special attention has been given to expanding the use of dialdehyde starch—this starch conveys wet strength (retains useful degree of strength when wet) to paper toweling, facial tissues, and the like—a quality that is desired by consumers in all household paper products. (Presence of wet strength is why the facial tissue is able to resist the pressure of Harry James' High C during the TV commercial.)

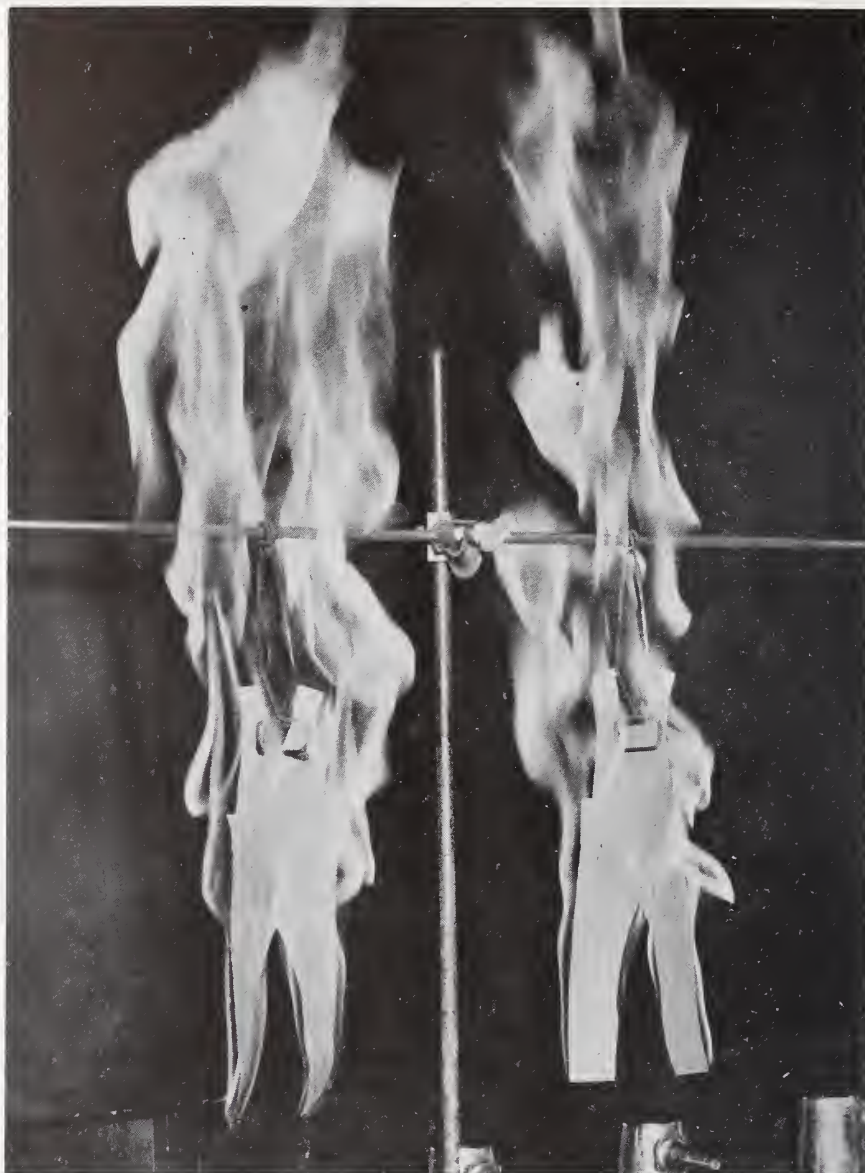
Still further, industrial outlets for dialdehyde starch are promised in paper coatings and in glues for southern pine plywood, a newly-developing industry which began commercial production in 1963. Majors is including southern pine plywood producers among his clientele this year.

One of the stiffest tests that utilization specialists have is that of increasing the utility of cotton in competition with synthetic fibers tailored for special uses. Cotton represents a more than \$2 billion-a-year cash crop for farmers. It is our Nation's most important farm-grown industrial raw material. With the emergence of syn-

thetic fibers, cotton has lost important markets. The synthetics gained a foothold because of their special advantages in certain uses, and heavy promotion by the synthetic fiber industry. Agricultural research has been working toward better utilizing the natural qualities in cotton and modifying the fiber to add other valuable properties.

Since 1941, science has discovered more new facts about cotton than during all the previous history of cotton fiber. The major part of this new knowledge came from the Department's research at the Southern Utilization Research Laboratory. Through chemistry, many improved properties can be imparted to cotton to aid in meeting the increasing competition of synthetic fibers. Widespread consumer acceptance of easy-care cottons provides an outstanding example of successful industry application of chemical finishes to aid cotton utilization. In recent years easy-care cotton finished fabric production has totaled about 2 billion linear yards annually. Easy-care cotton fabrics represent nearly 15 percent of current U.S. woven textile production and utilizes nearly a million bales of cotton annually.

FES has two utilization specialists charged with responsibility for increasing the utility and market for cotton. Lawrence L. Heffner is officed at the School of Textiles, North Carolina State University in Raleigh and William J. Martin is at Clemson University, South Carolina. Both of the FES utilization specialists' programs are based on Southern Utilization Laboratory research findings. Heffner's responsibility is to assist management personnel of research and development programs in cotton chemical processing methods. In 1964, chemically-processed cotton accounted for about 60 percent of the total U.S. production of woven textile of all fibers. Heffner's major emphasis is concentrated on extending research for imparting improved luster, strength, stretch, easy care, abrasion resistance properties to cotton.

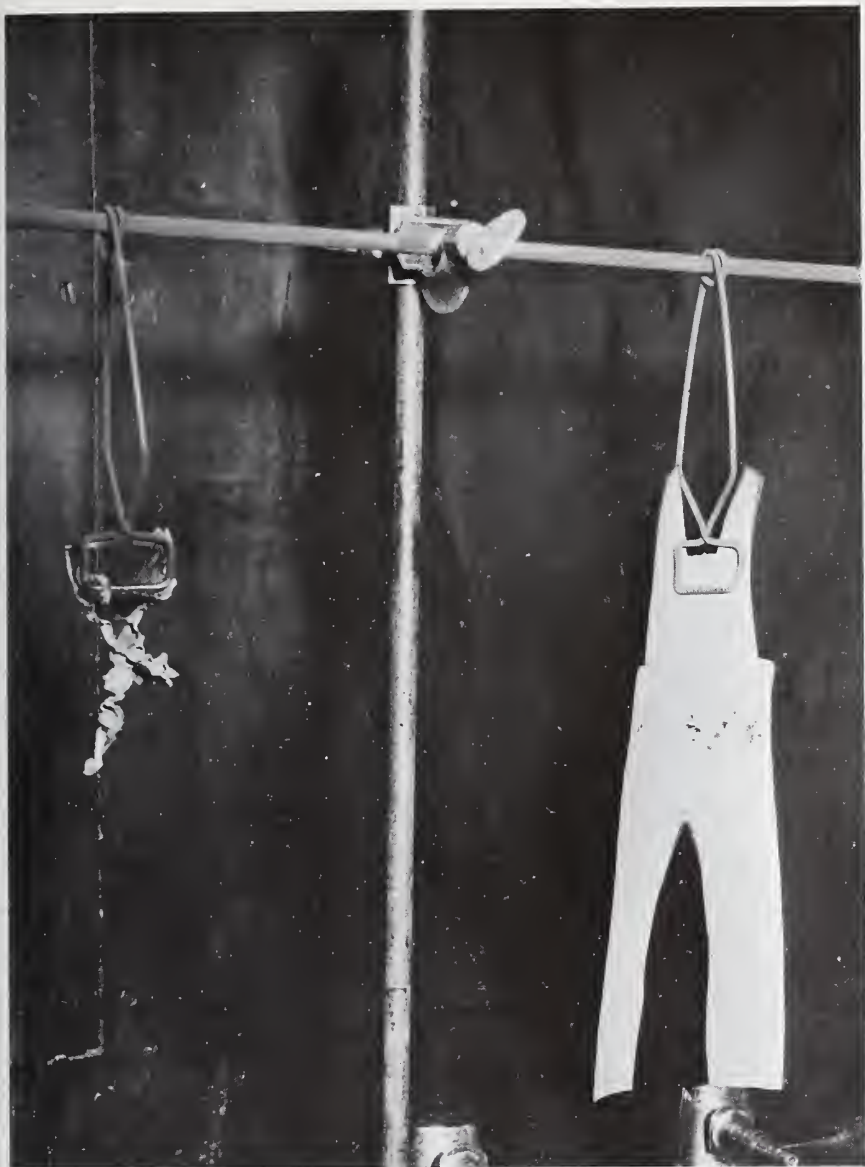


The material on the right was given flame-resistant properties.

Martin is also striving to improve the competitive position of cotton by aiding operators of textile mills to reduce costs and improve product quality through the use of improved mechanical processing methods and equipment. He is helping management personnel of these mills to evaluate the SURL's opener-cleaner as a means of improving efficiency in the mills' opening room and as a vehicle for blending. Martin is also assisting management personnel to

evaluate the fiber retriever aimed at improving labor efficiency and reducing waste and evaluating alternatives for establishing greater efficiency in the yarn and spinning process.

The significance of cotton utilization work and its benefit to producers is evident from the potential for stretch cotton fabrics. It is estimated that the potential for stretch fabrics is more than 2 billion yards—comparable to wash-wear. Such a potential, if realized, would require over



The material at left is completely burned; the treated remains in tact.

a million bales of cotton annually.

In the fruit-and-vegetable category the development of frozen orange juice in cooperation with the Florida Citrus Commission was one of the most notable achievements of the utilization laboratories. The retail value of frozen orange juice concentrate today is more than \$300 million a year. Utilization research has supplied information for improving freezing techniques, equipment, and storage information to help proces-

sors, distributors, retailers, and consumers maintain the original high quality of frozen foods.

Continuing study in this field has led to other developments, including dehydrofreezing. This process combines two established methods of food preservation—drying and freezing. It offers an economical method of preserving fruits and vegetables, while contributing to high food quality.

Potato processing has expanded very rapidly in recent years. In 1940,

less than 2 percent of the potato crop was processed. Today, approximately one-third of all the potatoes used for food are consumed in the form of chips, frozen french fries, dehydrated mashed potatoes, and other products. Further expansion of processing is expected. The growth of potato processing is credited with reversing the previous steady decline in consumption of potatoes by virtue of the appeal of convenience products to the consumer and thus has had a very significant impact on the economic well-being of the potato industry.

Irvin C. Feustel, FES Fruit and Vegetable Utilization Specialist at the Western Utilization Research and Development Division laboratory in Albany, California (fruit and vegetable utilization research is also done at the Eastern and Southern Utilization Research Laboratories), has been specializing in potatoes and is providing assistance to processors and prospective processors of frozen and dehydrated potato products in solving technological and marketing problems related to plant feasibility and costs, raw material suitability, adoption of new or improved processing technology, and quality and storage stability of products.

The results of utilization research on other fruit and vegetable commodities are also being disseminated to industry. Notable among these efforts is Feustel's close cooperation in the organization of national commodity research conferences which serve to keep the industry collectively informed of latest developments in production, marketing and utilization, as well as to provide a forum for discussion of problems on which further research is needed. Commodities presently covered in this manner include potatoes and dry beans. A conference on apples is in the planning stage.

Unlike the grain and cotton utilization specialists where few, if any, State utilization counterparts are employed, Feustel spends considerable time supporting State specialists, especially with problems related to the



A chemist at the Southern Utilization Laboratory demonstrates soaking cotton cloth with an experimental wash-wear resin. He is wearing a wash-wear shirt that was washed and dried more than 20 times without ironing.

suitability of raw commodities for processing and how new technological developments might be applied in their particular areas. The State specialists in turn serve a very important function in disseminating this information to their respective industry clientele.

To help round out FES's utilization program and to utilize the limited resources devoted to this program more effectively, an Agricultural Marketing Act contract has been awarded to the University of Maryland for the purpose of testing methods and procedures for coordinating economic and technical information in the extending and application of dairy utilization research.

Wendell S. Arbuckle and Leonard Blanton of the Maryland Extension Service will work closely with the Eastern Utilization Research Laboratory in Philadelphia as well as with State Extension specialists in com-

pleting the requirements of the contract.

The dairy products processing industry is encountering many changes resulting from the adoption of new technology in product quality control, automation of many processes, introduction and test marketing of many new milk products.

The dairy contract appears to be most timely as USDA scientists are now attempting to develop a method for producing a high-quality, dry, whole milk. Their achievement thus far is a whole-milk powder that reconstitutes instantly in cold water, it has the full flavor of fresh milk, and retains its flavor for several months under ordinary refrigeration. Their objective is a powder that can be stored at room temperature for several months without flavor change.

Successful large-scale production of dry whole milk would provide consumers (domestic and foreign mar-

kets) with milk at lower costs. The resulting increase in consumption could lead to substantial increases in the use of feeds and forage.

There are 30 Extension dairy technology specialists employed in the States. Most of the State specialists' educational work is concentrated with dairy industry firms on problems related to the marketing and moving of milk to the consumer.

Although FES's utilization program is still relatively new—less than 10 years old—its contribution in extending the research of the regional utilization laboratories is widely recognized by industry groups and other government agencies. In addition, utilization research workers recognize the importance of extension specialists conveying to them the need for additional research to improve old products and opportunities for developing new and better products and procedures. □

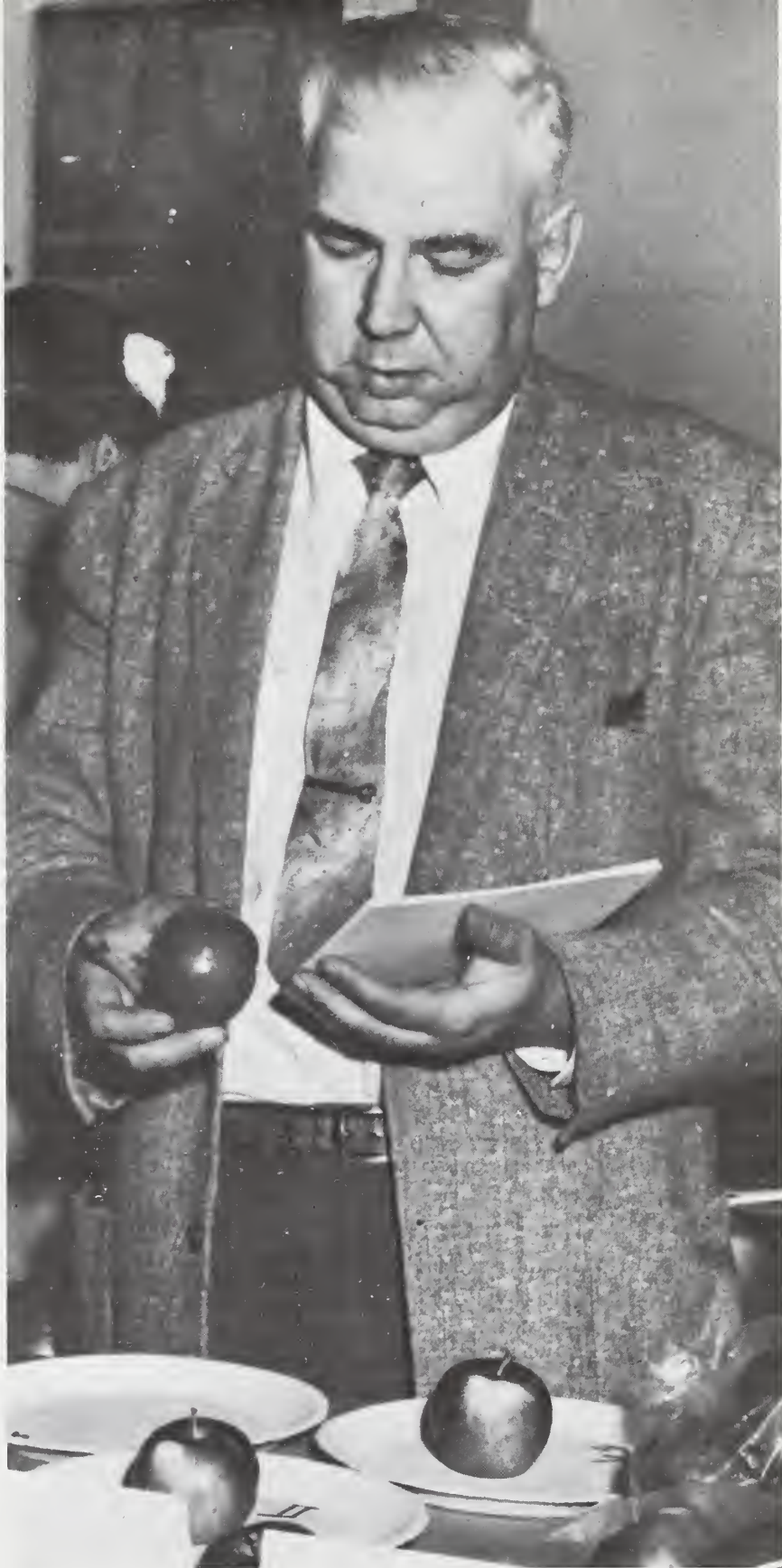
Market Tests Accelerate Commercialization Of New Processing Technologies

by W. SMITH GREIG
*Extension Marketing Specialist
Michigan*

FLAKE DRYING, dehydrofreezing, essence recovery, foam-mat drying, explosive puffing, freeze-drying, and irradiation are becoming common terms to fruit and vegetable processors. These new processing technologies mean new food products. New food products may cause: (1) increases in demand for particular products; (2) changes in comparative advantages among processing areas, and result in economic development in those areas. Market structure changes may also occur when products historically marketed fresh begin being marketed in processed forms.

Fruit and vegetable processing has had the most rapid growth of any agricultural processing industry except poultry. Now, over half of the commercial crop of fruits and vegetables in the U. S. is processed. Fruit and vegetable processing has increased at a rate of 4.9 percent per year since 1947 while population growth has been around only 1.7 percent per year.

Dehydration is the most rapidly-increasing fruit and vegetable processing technique, followed by freezing, pickles and sauces, and canning. Much of the increased processing is from the adoption of new processing technologies. However, the technical



aspects of some new processing methods are often available for years before commercialization is actually begun.

Are there ways of speeding up and helping guide this commercialization process? One way is through market tests to determine market potentials for new processed products.

Many of the new fruit and vegetable processing technologies have been developed by the Regional Research Laboratories of the USDA. Personnel at these laboratories develop the technical and engineering aspects of a new processing method, and often develop engineering cost data. Similarly, the Economic Research Service often conducts some tests of market potentials.

However, there is often much applied work which can and should be done by State or local groups in adopting these data to local conditions, and in supplying supplemental information to prospective processors. Involvement of local groups in the process of market testing increases and maintains their interest and is a key force in increasing their knowledge concerning the feasibility of utilizing a new processing technology. Some examples of market development work we have done at Michigan State follow:

Potatoes: After the potato flake process was developed by USDA personnel at the Eastern Regional Research and Development Division, and before any commercialization, a series of market tests was conducted in Michigan involving local groups. (An initial retail sales test was conducted by the USDA in Endicott-Binghamton-Johnson City, New York. This was the first market test conducted on potato flakes.) Two potato growers' associations furnished the raw potatoes and a potato chip manufacturer sent the potatoes to the Philadelphia Laboratory which processed them into flakes. Consumer preference tests were conducted comparing potato flakes to other dehydrated potato products. The institutional market was estimated through

a demonstration-interview technique in 200 hotels, restaurants, and institutions; a package was designed and a retail sales test and elasticity of demand market test were conducted.

Two grower groups, the Michigan Potato Industry Council and the Michigan Department of Agriculture, actively participated in the development of these market tests, both in the planning stages and in partially financing the tests.

The results of the market tests were published in three separate publications and distributed nationally and internationally. In less than a year's time there were few Michigan growers or processors who were not familiar with the process, the product, and the results of the market tests. An initial attempt to process potato flakes in Michigan failed. However, a new plant to process both potato flakes and frozen french fried potatoes is now under construction.

In the U. S. as a whole, millions of hundredweights of potatoes are now dehydrated by the potato flake process each year. Per capita consumption of potatoes, after a long decline, has increased nearly 10 percent in the past 10 years. This increase in consumption is largely associated with increased processing, including dehydration as well as potato chips and frozen french fried potatoes.

Apples: Market tests were conducted on dehydrofrozen apple slices using the product from the first commercial processing line in the country. The dehydrofrozen products are one-half the weight and volume of slices frozen normally. Thus, packaging, storage, and transportation costs are reduced by at least one-half resulting in considerable savings over the cost of the added dehydration step in processing.

Apple pies made from dehydrofrozen apple slices were compared to pies from normally-frozen apple slices through a consumer preference panel. Results were highly in favor of the dehydrofrozen slices. After this initial test the market potentials at the hotel, restaurant, and bakery level

were estimated by a use test in a sample of Detroit bakeries and institutions. In these tests the dehydrofrozen samples were very acceptable but the dehydrocanned samples were judged inferior to normally-canned slices. These tests were conducted in 1960.

By 1964 approximately half of the apples frozen in New York State were processed by the dehydrofreezing process. The initiator of the first commercial line has indicated that the work on market potentials "really made the market" for the dehydrofrozen slices.

Apple Juice Concentrate: As a part of a USDA study of market potentials for super-concentrated apple juice, a Michigan processor was selected to supply the super-concentrate. This processor had concentration and essence recovery equipment but had never processed apples before. Several thousand cases of 6-to-1 apple juice concentrate were prepared for the market test. For this process the juice is reconstituted by adding 6 cans of water to 1 can of concentrate. In the essence recovery process the volatile constituents driven off in the concentration steps are recaptured and added back to the concentrated fruit juice. This processor last year processed nearly a million bushels of apples into apple juice concentrate. Much of this new processing operation may be contributed to his involvement in a market test.

Onions: Working with the onion industry and using products from a processor in New York and one in Tennessee, the institutional market potentials for frozen diced and other onion usage in nearly 1,000 hotels, restaurants, and institutions, a large potential for a factory-processed onion ring was discovered. Based on these results and from work with industry groups, a small factory to process french fried onion rings was developed in Michigan. A publication on the processing potentials for onions was widely distributed in the U. S., and requests for copies were received from 10 foreign countries.

The increased interest in the potentials for onion processing in Michigan has accelerated the interest in an onion breeding program to produce varieties more adaptable to dehydration and for french fried onion rings. The locational advantage to Central and Eastern markets which Michigan would have over California in onion dehydration is lost because of the present higher dry matter content of California-grown varieties.

Blueberries: At the request of the Michigan Blueberry Growers Association and in cooperation with the Eastern Regional Research and Development Division of the USDA, blueberries were experimentally explosively puff-dried. In the explosive puffing process, partially-dehydrated fruit and vegetable products are heated in a container with a quick-opening lid. When the lid is opened after heating, the products expand and become porous, which makes them rehydrate quickly—this makes them fast and easy to prepare by the housewife.

The explosively-puffed products were incorporated into muffins by the home economics department at Michigan State University and compared to muffins made with normally-canned blueberries in a consumer preference panel. The explosively-puffed blueberries in muffins were just as acceptable as canned blueberries. One objective of the tests was to see if the dried blueberries from the explosively-puffed process could be directly incorporated into a dry muffin mix rather than the current system in which a small tin of canned blueberries is placed with the dry muffin mix.

In contrast to the positive results obtained for dehydrofrozen apples, pies made from dehydrofrozen blueberries did not turn out to be as acceptable as pies from normally-frozen blueberries. The design of the particular tests did not permit us to determine the reasons why the dehydrofrozen pies were not as acceptable. It could have been the stage of technology, it could have been the particular reconstitution methods used, or perhaps the pie recipes should be

changed with the dehydrofrozen products. Perhaps slight modifications of any of the three would have yielded an acceptable product. Developments in processing technologies are nearly continuous. Thus, any market tests are more or less screening tests of acceptability at a *particular stage* in the development of the technology, marketing explosively-puffed carrots.

As yet there has been no commercialization of the explosive-puffing process for blueberries but the process looks good for some purposes. Fruits and vegetables shot from guns will probably be a reality in the near future. One California processor is now marketing explosively-puffed carrots.

These are examples of work primarily on market potentials for new products. Other parts in the area of new processing technologies in which economists or marketing specialist may work effectively are feasibility studies, plant location studies, and economic-engineering studies. Recently at Michigan State University we

have been involved in some linear programming transportation models of the effect of new processing technologies on future locations of the fruit and vegetable processing industries. If new dehydration or concentration technologies are adopted, the freight rates are reduced causing changes in comparative advantages. These freight changes can be integral parts of feasibility studies of the potentials for new processing technologies.

In each of these examples, involvement of county agents and local industry groups was essential for effective Extension efforts. In fact, county agents and district marketing agents were instrumental in initiating some of the projects and in maintaining industry interest. The involvement of farmers and local industry groups takes many forms. It not only provides a ready market for the information developed, but it also assures that the problems attacked are the relevant ones as far as grower and industry groups are concerned. □



The institutional market was estimated by interviews with chefs.

From The Administrator's Desk

The first of last month, Dr. Robert J. Pitchell reported for duty as Deputy Administrator of the Federal Extension Service. He brings to that post outstanding experience in administration, education, and program development.

Prior to joining our staff Dr. Pitchell was Program Director of the Staff Training Program for Project Head Start with the National University Extension Program.

Previously he was President of Roosevelt University in Chicago, and before that a member of the faculty at Indiana and Purdue Universities. At Indiana and Purdue he was associate professor of government. He was also associate director of the Institute of Public Administration at Indiana. Dr. Pitchell is the author or co-author of numerous tax and educational reports which have had wide use in rural areas.

During 1963 he served as Legislative Assistant to Senator Birch Bayh, while on leave from his position at Indiana University. Earlier he was Director of the Indiana Commission on State Tax and Financing Policy.

Dr. Pitchell holds an A.B. degree from Fordham University, and a Ph.D. in political science from the University of California (Berkeley).

He served as an officer in World War II and the Korean conflict. He is a member of the American Political Science Association, American Academy of Political and Social Science, American Society for Public Administration, and various higher education associations.

Dr. Pitchell fills the vacancy left by John A. Cox, who completed a year's on-leave assignment and returned to his post as Director of the Cooperative Extension Service in Louisiana March 19.

Dr. Pitchell's native State is New York.

I know you join me in welcoming Deputy Administrator Pitchell to the great educational venture of Cooperative Extension.—Lloyd H. Davis



Dr. Robert J. Pitchell